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19 February 1964

MEMORANDUM FOR: Chairman, Technical Development Committee  
THROUGH : Executive Secretary, TDC  
SUBJECT : Staff Study - [REDACTED] Zoom Magnifier

25X1A

I. PROBLEM:

To improve the performance of the Photo Interpreter's Tube Magnifier for use on small scale imagery.

II. FACTS:

A. The most used item of PI equipment in NPIC is the 7X tube magnifier; however, the instrument is inadequate for the exploitation of the small scale imagery obtained from current operational systems; in addition, this is also true for images on the outermost portions of the B configuration obliques.

B. The use of a higher power tube magnifier presents its own problem since as the power increases, the field of view decreases; furthermore, the working distance of the magnifier decreases to the point that the instrument can not be comfortably used. The present limit for a reasonably comfortable magnifier is approximately 12X.

C. It is apparent that no fixed magnification instrument can provide the proper compromise between optimum magnification and optimum field of view; consequently, a continuously variable (Zoom) tube magnifier is required.

D. This proposal is in response to a request from P&DS and is based upon a company funded feasibility study and preliminary design.

E. [REDACTED] preliminary design indicates they can meet the following parameters:

1. Magnification range of approximately 8X to 18X.
2. Satisfactory aberration correction.
3. Light weight (4 to 7 ounces).
4. Maximum height of 86mm. (3.38").
5. Minimum height of 80mm. (3.15").
6. Field size, 15mm at 8X and 4.44mm at 18X.

Declass Review by NIMA/DOD

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GROUP 1  
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downgrading and declassification

25X1A SUBJECT: Staff Study - [REDACTED] Zoom Magnifier

7. Working distance approximately 15mm.

8. Erect image.

25X1A F. [REDACTED] also indicates that:

1. The scales would be compatible with their (7X Measuring Magnifier Scales).

2. The stand would be the same (clear plastic tube) used in the 7X Magnifier.

G. The Zoom system is composed of three (3) doublets with two (2) of the doublets being positioned by a spiral cam and activated by rotation of an external ring or sleeve.

H. A Manual of Operation will be provided.

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25X1A I. [REDACTED] has proposed to design and fabricate a prototype under a 10 month CPFF contract at a total estimated cost and fixed fee of [REDACTED]

### III. CONCLUSIONS:

A. The development of a small, (hand-sized), light weight, Zoom tube magnifier would provide the PI with a highly versatile uncomplicated tool to aid in the exploitation of current and future small scale photography.

B. A zoom tube magnifier would permit each individual PI to pick that one combination of magnification and field of view which is optimum for the particular imagery being studied.

C. Photo Interpreters vary considerably in their personal preferences as to what magnification power they would prefer. This approach would permit one instrument to replace two (2) or more other magnifiers.

25X1A D. [REDACTED] quoted figure of [REDACTED] CPFF appears reasonable 25X1A respect to the formidable optical design problem involved; however, it would appear to be to NPIC's and the Government's advantage to negotiate this contract CPIF. This could result in a slightly higher initial contract cost but should result in overall savings by minimizing the possibility of overruns.

### IV. RECOMMENDATION:

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25X1A That NPIC sponsor and P&DS monitor a [REDACTED] CPIF contract for up to but not exceeding [REDACTED] for the design and fabrication of a prototype Zoom Magnifier.

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[REDACTED]  
Development Branch, P&DS

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